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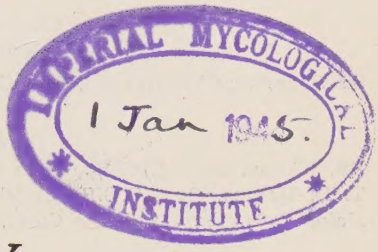
THE KENT INCORPORATED SOCIETY
FOR PROMOTING EXPERIMENTS IN
HORTICULTURE



SUPPLEMENTARY
ANNUAL REPORT

(THIRTY-FIRST YEAR)

GENERAL DEVELOPMENT AND ACTIVITIES

EAST MALLING RESEARCH STATION

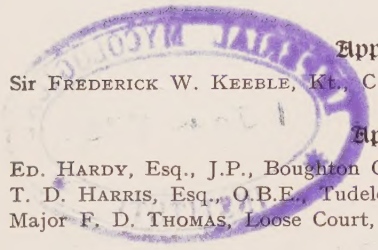
Near MAIDSTONE

KENT

1st January, 1943, to 31st December, 1943

Published August, 1944

GOVERNING MEMBERS OF THE SOCIETY



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Appointed by the Senate of the University of London:

Professor WM. BROWN, D.Sc., F.R.S., Imperial College of Science and Technology, South Kensington, London, S.W.7.

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Professor E. J. SALISBURY, C.B.E., D.Sc., F.R.S., University College, Gower Street, London, W.C.1.

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H. W. HARMAN, Esq., 16 Southwark Street, London, S.E.1.

Appointed by the Research Fund Committee of the Institute of Brewing:

G. T. COOK, Esq., Queen's Avenue, Maidstone, Kent.

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W. T. Edmonds, Esq., Allington Farm, Maidstone, Kent.
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S. W. Mount, Esq., Hode Farm, Patrixbourne, Canterbury, Kent.
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J. A. Raynham, Esq., Dairy Farm, Marden, Kent.
J. M. Robertson, Esq., Beluncle, Hoo, Rochester, Kent.
J. F. Towner, Esq., Salts Farm, Loose, near Maidstone, Kent.

Appointed by the Council of the Horticultural Trades' Association:

L. J. Cook, Esq., 7 Drapers Road, Enfield, Middlesex.

Appointed by the Associate Members of East Malling Research Station:

Stuart Macdonald, Esq., Little Baddow Hall, near Chelmsford, Essex.
Captain R. Wellington, M.C., Worth, Hele, Bradninch, S.O., Devon.

Appointed by East Malling Research Station:

R. G. Hatton, Esq., C.B.E., M.A.(Oxon.), D.Sc.(Lond.), V.M.H., F.R.S.

Appointed by the Staff Council of East Malling Research Station:

W. S. Rogers, Esq., M.A.(Cantab.), Ph.D.(Lond.), Dip.Hort.(Cantab.), A.Inst.P.

MEMBERS OF THE EXECUTIVE COMMITTEE

(Governing Members elected at the General Meeting, September, 1942)

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Professor F. T. Brooks, M.A., F.R.S.
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T. Neame, Esq. (Chairman, Finance Sub-Committee).
J. M. Robertson, Esq.
Professor E. J. Salisbury, C.B.E., D.Sc., F.R.S.
J. E. Sandall, Esq.
Capt. R. Wellington, M.C.

Co-opted Members:

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W. Rogers, Esq., Court Lodge, Horton Kirby, Kent.
Lt.-Col. Sir Albert Stern, K.B.E., C.M.G., Barham Court, Maidstone, Kent.

The Director:

R. G. Hatton, Esq., C.B.E., M.A.(Oxon), D.Sc.(Lond.), V.M.H., F.R.S.

The Representative of Staff Council:

W. S. Rogers, Esq., M.A.(Cantab.), Ph.D.(Lond.), Dip.Hort.(Cantab.), A.Inst.P.

STAFF (June, 1944)

Director : RONALD G. HATTON,* C.B.E., M.A.(Oxon.), D.Sc.(Lond.), V.M.H., F.R.S.

Assistant to Director : T. N. HOBLYN,* Hort.Dip.(Wye).

Pomology : R. G. HATTON.*
W. S. ROGERS, M.A.(Cantab.), Ph.D.(Lond.), Dip.Hort.(Cantab.), A.Inst.P.
N. H. GRUBB, M.S.A.(Cornell).
J. AMOS, N.D.H.
Miss A. B. BEAKBANE, Ph.D.(Lond.), N.D.H.
R. J. GARNER, N.D.H., Dip.Hort.Sci.(Reading).
TH. RAPTOPOULOS, Ph.D.(Lond.). *Special Assistant.*
J. FLOOR, l.i.(Wageningen). (*On leave from Royal Netherlands Forces.*)
Miss E. C. THOMPSON.
Miss E. M. GLENN, B.Sc.(Lond.).
Miss H. M. HUGHES, B.Sc.(Lond.), Dip.Hort.(Swanley).
Miss J. M. BUTTFIELD, N.D.H., Dip.Hort.(Swanley). (*Special Assistant, Nuclear Stocks Scheme. Appointed July,* 1943.)

Lab. and Field Assistants :
C. H. W. SLATER. (*On Active Service.*)
Miss E. C. M. ASHDOWN.
Miss F. M. HODGES.
G. WELLER. (*Workshop and Recorder.*)
Miss D. OLIVER.
Miss O. ROBINSON.
Mrs. M. E. J. BINGHAM.
Miss D. E. A. YATES. (*Appointed August,* 1943.)
R. A. ADAMS.

Plant Breeding : H. M. TYDEMAN.

Marketing Investigations : A. C. PAINTER. (*On Active Service.*)

Walnuts : A. W. WITT, N.D.H. *Consultant.*

Hops : F. H. BEARD, Hort.Dip.(Wye).

Statistics : T. N. HOBLYN.*
S. C. PEARCE, B.Sc.(Lond.).
Miss E. M. GLENN, B.Sc.(Lond.). (*Part-time—Records.*)
Miss A. SEARLE. *Computor.*

Plant Physiology : M. C. VYVYAN,* M.A.(Cantab.), D.Sc.(Lond.).
Lab. Assistants : G. F. TROWEL. (*On Active Service.*)
G. C. CHEESEMAN.
W. A. GIBBONS.

Biochemistry : W. A. ROACH,* D.Sc.(Lond.), A.R.C.S., D.I.C., A.I.C.
Mrs. W. O. ROBERTS, B.Sc.(Wales). (*Seconded for War Service from Education Committee of City of Liverpool.*)
J. P. R. RICHES, M.A.(Cantab.).
S. G. THOMPSON, M.A.(Oxon.).
C. BARCLAY, M.A.(Cantab.), Dip.Agric.(Cantab.). *Field Officer.*
Miss H. M. HOLMES, Dip.Hort.(Swanley). *Assistant Field Officer.*
Special Assistant : Miss M. E. BUNYARD. (*Appointed April,* 1944.)
Lab. Assistants :
Miss E. M. PARKER.
Miss E. M. FORD.
Miss P. W. ARNUP. (*Resigned February,* 1944.)
Miss J. RALPH. (*Resigned February,* 1944.)
Miss D. F. E. MARTIN. (*Resigned March,* 1944.)
Miss C. C. MACNAMARA. (*Appointed June,* 1943.)
Miss J. GANDON. (*Appointed September,* 1943.)
Miss D. E. T. HOOK. (*Appointed March,* 1944.)
Miss B. KIDWELL. (*Appointed April,* 1944.)
C. K. KING.
B. K. WOOLLARD. (*Resigned September,* 1943.)
R. GREENFIELD. (*Appointed April,* 1944.)

Members of the Staff of the Imperial College of Science and Technology working in collaboration with the Biochemistry Section :
B. D. BOLAS,* D.Sc.(Lond.), D.I.C.
D. W. GOODALL, Ph.D.(Lond.), D.I.C.
Lab. Assistant : J. H. LAVENDER.

Plant Pathology : R. V. HARRIS,* B.Sc.(Lond.), A.R.C.S., D.I.C.
H. WORMALD, D.Sc.(Lond.), A.R.C.S., D.I.C.
M. H. MOORE, Dip.Hort.Sci.(Reading).
W. G. KEYWORTH, Ph.D.(Lond.), A.R.C.S., D.I.C.
I. W. PRENTICE, B.Sc.(Glasgow).
I. ISAAC, B.Sc.(Wales)., Ph.D(Cantab.). *Research Assistant, Hop Diseases.*
C. H. CADMAN, B.Sc.(Liv.), Ph.D.(Edin.). *Research Assistant, Raspberry Diseases Investigations in Scotland.* (*Appointed November,* 1943.)
Miss M. P. ENGLISH, M.Sc.(Lond.). *Research Assistant attached to Plant Protective Chemistry.* (*Appointed October,* 1943.)
Miss M. BENNETT, B.Sc.(Lond.), Dip.Hort.(Swanley). *Field Officer. Also attached Entomology and Plant Protective Chemistry.*
Lab. Assistants : G. P. R. MOUNT. (*Resigned November,* 1943.)
R. D. SOUTER.
Miss B. I. FLEET. (*Appointed November,* 1943.)
Miss F. J. NEWING. *Virus Diseases.* (*Appointed May,* 1944.)

* Recognized Teacher of the University of London.

Entomology : A. M. Massee,* D.Sc.(Lond.), F.R.E.S.
G. H. L. Dicker, Ph.D.(Lond.).
P. H. Tuft, B.A.(Cantab.). *Special Research Assistant attached to Plant Protective Chemistry.*
Lab. Assistants : F. Cronk.
E. F. Souter.

Plant Protective Chemistry : H. Shaw, M.Sc.Tech., Ph.D.(Manc.).
J. K. Eaton, B.Sc.(Wales), M.Sc.Tech.(Manc.). (*Transferred March*, 1944.)
Recorders and Lab. Assistants : R. G. Gambrill. *Recorder.* (*On Active Service.*)
D. A. Mithen. (*On Active Service.*)
A. C. M. Codd. (*On Active Service.*)
Miss A. J. Collings.
J. T. Greaves. (*Appointed April*, 1944.)

Technical Section : H. B. S. Montgomery, B.A.(Dublin), Ph.D.(Lond.), D.I.C.
N. B. Bagenal, B.A.(Cantab.). (*Seconded to Ministry of Food.*)
B. F. G. Levy, B.A.(Cantab.), Hort.Cert.(Reading). (*On Active Service.*)
Guide Demonstrator and Exhibitions Officer : Vacant.

Advisory Officers in Commercial Fruit Growing to the Kent Education Committee, stationed at East Malling Research Station : W. G. Kent, N.D.H., and C. R. Thompson.

Experimental Nurseries : D. H. Hammond.

Experimental Greenhouses : A. Tidy.
Miss E. K. Joyce. (*Appointed October*, 1943.)

Meteorological Records : H. C. Chapelow.

Photographer : Vacant.

Lab. Steward : R. G. Gambrill. (*On Active Service.*)

* Recognized Teacher of the University of London.

ADMINISTRATION.

Secretary : C. T. Royle.

Book-keeper : P. R. Wood.

Farm Clerk : A. J. Spiller.

Director's Personal Secretary : Miss L. E. Alexander.

Clerical Staff : Miss J. M. Coy, Miss G. O. Ardagh, Miss H. D. Gilmore (*On Active Service*), Miss J. D. Martin (*On Active Service, January*, 1943), Miss M. G. Arnup, Mrs. V. E. Durey (*Part-time*), Miss D. T. Gardner, Miss B. K. Wright, Miss G. Mitchell (*Appointed April*, 1943), Miss L. M. Godden (*Appointed November*, 1943).

VISITORS.

The headquarters of the East Malling Research Station are at Bradbourne House, Larkfield, near Maidstone, and all visitors should enquire there for the Technical and Advisory Section.

Visitors coming by road should take the turning to East Malling, opposite " The Bull ", Larkfield, on the main London-Maidstone road. The entrance gate to Bradbourne is on the left approximately 300 yards down the road.

Bus Service : From Maidstone by the Maidstone and District Motor Services Limited, every 20 minutes from Maidstone to Larkfield.

Passenger Station : East Malling Halt (Southern Railway). *Goods Station :* Aylesford (Southern Railway).

Visits : Visits may be paid by appointment with the Technical Section on any weekday, Saturday afternoon under exceptional circumstances only.

Enquiries and Correspondence : All correspondence should be addressed to The East Malling Research Station, near Maidstone, Kent.

Telephone : Aylesford 7294 (2 lines). *Telegrams :* Research, East Malling.

THE IMPERIAL BUREAU OF HORTICULTURE AND PLANTATION CROPS

Accommodated at Bradbourne, the Administrative Headquarters of the East Malling Research Station.

STAFF.

Director : Ronald G. Hatton, C.B.E., M.A.(Oxon.), D.Sc.(London), V.M.H., F.R.S.

Deputy Director : D. Akenhead, M.A.(Oxon.), B.Sc.Agric.(London).

Assistants : G. St. Clair Feilden, B.A.(Oxon.).
V. H. Goldschmidt, Ph.D.

Clerical Staff : Miss M. B. Rogers, Miss M. M. Durling (*On Active Service*), Mrs. B. Akenhead.

Telephone : Aylesford 7294 (2 lines).

GENERAL DEVELOPMENT AND ACTIVITIES

Introduction.—This 31st Supplementary Annual Report of the Committee records a year of solid achievement, in which all associated with the Station may well take some modest pride. Difficulties, inevitable in the fourth year of war, have had to be faced, but, while continued anxious thought and planning have been and will be necessary to overcome them, on the whole at the end of 1943 the Institute was in a stronger position, both with regard to finance and research in progress, than ever before in its history.

Much of this achievement, which is the result of years of endeavour, may be attributed to the wise guidance of the Chairman, Mr. S. W. Mount, whose retirement at the end of the year the Committee very much regret to have to place on record. Mr. Mount was first appointed a member of the Governing Body in 1929 as a representative of the National Farmers' Union, and in the fifteen years since that date he has served the Station on the Executive Committee, first as Chairman of the Finance Committee, then as Vice-Chairman and finally, since August 1936, as Chairman, through more than one critical period. His wide experience has been used unreservedly in the best interests of the Institute and his help and guidance in many matters affecting the staff and administration of the Station have been of the greatest possible value in the developments of recent years. There is no doubt that members will desire to show some mark of their appreciation of Mr. Mount's services ; in the meantime the Committee would take this opportunity of wishing him complete restoration to health. They feel sure that his interest in the Station's activities will be maintained and look forward to having the benefit of his advice for many years to come.

For the first time, the end of the financial year has found the Research Farm Account not only free of a bank overdraft, but with a substantial credit balance. With the other Station accounts in a similar satisfactory state, the Finance Committee have been discussing with the Ministry of Agriculture schemes for placing the finances of the Experimental Farm on a firmer footing. As fruit grower members will be well aware, the need for a substantial reserve against calamitous frost years has been demonstrated again only too quickly and, while the occurrences of May, 1944 will undoubtedly prove a setback, the Committee still hope that eventually a practicable scheme will be evolved.

The list of Associate Members has continued to grow steadily. While it was not possible to arrange an open day for members during the year, members of staff have attended several demonstrations and conferences in various parts of the country, and we were glad to welcome to East Malling more than one party with special interests. Of these, the visits of the Horticultural Trades' Association, of the Institute of Brewing's Advisory Sub-Committee on Hops and of growers particularly interested in the problems of raspberry growing were especially welcome. We look forward to the time when it will again be possible to arrange the regular gatherings of our members, which have proved of such value in more peaceful times.

It was with very great pleasure that the Committee learned of the election of the Director as a Fellow of the Royal Society. Our members will regard this as a well-merited recognition of his outstanding pioneer work in the cause of horticultural science and as an honour to the Institute he has done so much to develop.

Since June, 1943, there have been few changes in the senior staff, the calls upon whom, it may be noted, for service on external committees have become increasingly numerous. The year has been noteworthy for the expansion of research in several fields, and the growing number of collaborative research projects, initiated under the auspices of the Agricultural Research Council, in which the Station has been asked to participate. In some Sections the assistant research staff has been reinforced to meet the needs of these new developments.

Obituary.—The Committee record, with regret, the death in December, 1943, of The Marquis Camden, of Bayham Abbey, Lamberhurst. He had been associated with the work at East Malling since 1914, and had taken much interest in the acquisition of the Bradbourne Estate. It was largely through his help that, under very difficult circumstances, the public appeal was launched and proved such a success.

Committees.—In view of the difficulties of summoning frequent committee meetings, our three Chairmen have, on numerous occasions, met informally to give their guidance upon *ad hoc* problems.

The War Emergency Committee (Chairman, Mr. S. W. Mount) met twice during 1943 to deal with routine matters, and it was not found necessary under the prevailing conditions to summon a meeting of the Executive Committee.

The Finance Sub-Committee (Chairman, Mr. T. Neame) met in January, 1944, to consider the general financial position of the Research Farm Accounts and the Membership Fund.

Last year an account was given of the history and progress of the Trustees Endowment Fund. In this Report we are including accounts of the history of the Research Farm and the Membership Scheme, which the Finance Committee had before them when considering proposals for the development of the Station during the coming ten years. A small sub-committee was nominated to carry on negotiations with the Ministry dealing with these proposals.

The Plant Prices Sub-Committee (Chairman, Mr. W. Talbot Edmonds) met in London in June, 1943, to discuss the season's prices for surplus nursery material. In view of the seriousness of the rootstock position, the Committee recommended that a meeting between the nursery trade and the Ministry should be arranged, in order to obtain some idea as to the position of supplies of nursery material in this country and the steps to be taken to safeguard the future. Subsequently, a meeting of H.T.A. members was held at East Malling—see report under Conferences—and discussions have taken place between members of the trade and the Ministry.

The Hop Sub-Committee and the Joint Hop Diseases Sub-Committee (Chairman, Mr. Arthur Amos) met together in August, and members of the Advisory Sub-Committee on Hops of the Institute of Brewing were invited to attend. Reports were submitted by Mr. G. Samuel, Professor E. S. Salmon, Dr. A. M. Massee, Dr. W. G. Keyworth and Mr. F. H. Beard. The seriousness of the Verticillium Wilt disease was emphasized, and a report of the meeting between representative growers and the Ministry in London in July, 1943, dealing with suggestions for the certification of hop sets, was placed before the meeting.

The Arable Farm Sub-Committee (Chairman, Mr. J. M. Robertson) met in March and October, and received satisfactory reports on the position of the arable farm.

Annual General Meeting.—The Annual General Meeting, presided over by the Chairman, Mr. S. W. Mount, was held at Bradbourne on Tuesday, 31st August, 1943. It had been hoped that it would be possible again to hold the annual Associate Members' gathering on the same day. However, difficulties of travel and catering proved too great, and it had regretfully to be abandoned.

The Director, Dr. R. G. Hatton, presenting his report, regretted that it had not been possible to get the Research Report printed in time to circulate it before the meeting. The business of the Institute had been largely in the hands of the War Emergency Committee, but certain sub-committees had met and the Director cordially thanked their members for their valuable advice and assistance.

In commenting on the work of the year, he told of the great encouragement it had been that the farm was then paying its way, while the staff as a whole were gratified at the large increase in the membership. The staff had tried to maintain a happy balance between problems of immediate national importance and the continuation of the main research projects. With the encouragement of the Agricultural Research Council, close collaboration with other Institutes had been most helpful.

The Director mentioned the large gathering of nurserymen who had had a most successful meeting at the Station recently, when they had reached agreement that a large proportion of the rootstocks to be distributed to the trade in 1943 would be used for the establishment of new stool beds to ensure the future rootstock supply for the country.

He then commented briefly on a number of articles in the Research Report, which he hoped would be ready very shortly.

The adoption of the Report was moved by Professor Brooks and seconded by Mr. Arthur Amos, and carried unanimously.

The Balance Sheet and Accounts were presented by the Chairman of the Finance Sub-Committee, Mr. T. Neame. Sir Albert Stern, in moving the adoption, congratulated the Committee on its handling of the financial situation. He thought the fact that almost £29,000 had been raised in wartime to pay for the Bradbourne Estate showed the tremendous vitality of the Institute, and he hoped this was no more than the beginning of what the Institute was going to do. The Farm Account he considered a matter for special congratulation.

Mr. Bruce Gibson seconded the motion and the Balance Sheet and Accounts were unanimously adopted.

On the motion of Mr. J. F. Towner, seconded by Mr. W. T. Edmonds, Messrs. J. Dix Lewis, Cæsar, Duncan & Co. were re-elected auditors for the year.

Finance.—A summary of the Research and Experimental Farm Accounts for the year 1st October, 1942, to 30th September, 1943, is given below.

For the first time the latter account shows a credit balance. The Experimental Farm now embraces 320 acres, though it is not anticipated that at any one period more than 160 acres will be in experimental fruit, hops or nursery work. The rest of the land will be in arable rotation in preparation for future experimental plantings.

Research Account.

1st October, 1942, to 30th September, 1943.

Expenditure.	£	s.	d.	Income.	£	s.	d.
Research and Administrative Salaries	19,785	15	4	Grant from Ministry of Agriculture ..	21,238	17	5
Laboratory Expenses and Equipment	1,052	5	1	Grant from Agricultural Research Council	185	0	0
General Maintenance Expenses ..	2,295	19	9	Contributions from Public Bodies ..	595	0	0
Balance, being excess of Income over Expenditure		1	4	Grant from Membership Fund	163	0	0
				Contributions from Industrial Bodies ..	100	0	0
				Refunds and Other Contributions to Salaries and Laboratory Expenses	673	18	2
				Sundry Receipts	178	5	11
	£23,134	1	6		£23,134	1	6

Supplementary Accounts (Special Grants).

Expenditure.	£	s.	d.	Income.	£	s.	d.
Salaries and General Expenses :				Balance in Hand, 30th September, 1942	63	13	5
Mineral Deficiencies Investigations on Agricultural and Horticultural Crops	3,880	15	0	*Special Grants :*			
Vernalization Investigations	20	18	4	Mineral Deficiencies Investigations on Agricultural and Horticultural Crops	4,715	1	2
Strawberry Nuclear Stocks Scheme ..	109	4	6	Vernalization Investigations	—	—	—
Cover Crops Investigations	314	6	1	Strawberry Nuclear Stocks Scheme ..	816	8	11
Classification of Rootstocks	315	3	1	Cover Crops Investigations	313	0	0
Hop Diseases Investigations	875	5	10	Classification of Rootstocks	355	10	0
Verticillium Wilt Disease Investigations	375	18	9	Hop Diseases Investigations	875	5	10
Balance of Special Grants carried forward at 30th September, 1943	1,626	7	9	Verticillium Wilt Disease Investigations	379	0	0
	£7,517	19	4		£7,517	19	4

Experimental Farm Account.

1st October, 1942, to 30th September, 1943.

Expenditure.	£	s.	d.	Income.	£	s.	d.
Farm Valuation, 30.9.42	15,800	8	11	Farm Valuation, 30.9.43	14,926	15	5
Farm Wages	14,690	18	7	Ministry of Agriculture Maintenance Grant	1,800	0	0
Farm Stores, Implements, Manures, Sprays and General Farm Expenses	8,134	13	11	Sales of Produce and Crops	34,324	9	3
Balance, being excess of Income over Expenditure	13,708	1	7	Sundry Receipts	1,282	18	4
	£52,334	3	0		£52,334	3	0

This farm has been developed without any working capital, and so a bank overdraft was inevitable from the earliest days. Only once in the Station's history, during the financial crisis in 1921, did the Development Commission make a loan of £2,500, which they subsequently made into a grant towards meeting the overdraft. In addition, since 1922 we have been allowed a sum of £30 an acre, on 60 acres only, to cover losses caused by experimental exigencies. Notwithstanding, between 1929 and 1940 the overdraft averaged about £5,000, reaching the high level of £10,000 in the frost years.

Last year we reported that, following a year of all-round heavy crops and reasonable prices, the overdraft had been reduced from £10,148 to £3,724. The year 1943 was another such season, and on 30th September we were able to carry forward a credit balance of £9,984.

In January, 1944, the Finance Committee met to review the position and to try to evolve a scheme, which would be acceptable to the Ministry of Agriculture, for placing the future financing of the farm on a sounder basis. As far back as 1933, we had opened negotiations with the Ministry of Agriculture and the Development Commission with regard to putting any balance of receipts into a fund for working capital, farm improvements and a reserve against bad years. Although at that time, as we still had an overdraft, it was considered premature to come to any definite agreement along these lines, we were actually empowered to start equipping the farm, under current expenditure, with necessary implements and better buildings. Then followed the frost year (1935), with a greatly increased overdraft. The matter fell into abeyance and the Committee were obliged to face these losses unaided.

With a credit balance of nearly £10,000, the Committee felt that the occasion had come to reopen the negotiations for the establishment of a reasonable reserve, which would guard against calamitous fluctuations and overdrafts and at the same time provide some working capital for future farm developments, and there was reason to believe such a project would receive favourable consideration by the Ministry of Agriculture, subject to certain conditions. How soon the need for such a fund was to be

unpleasantly emphasized by the occurrence of yet another disastrous spring frost, they could not foresee ! At the time of writing negotiations are still in progress, but the Committee feel that members should be fully informed of the position to date, though the outlook for 1944 is considerably different from what it appeared at the end of 1943.

Membership Scheme.—The number of members continued to grow steadily throughout 1943, reaching a new record of 1,746 by 30th September. In view of existing conditions, which give rather few opportunities for personal contact between members and the Technical Section, the Committee greatly appreciate this expression of the interest of the fruitgrowing community in the Station's work.

ASSOCIATE MEMBERS' FUND.

Receipts and Payments Account for the year ending 30th September, 1943.

EXPENDITURE.	£ s. d.	INCOME.	£ s. d.
To Grants and Contributions to Salaries	163 0 0	By Balance at 30.9.42, including Loan outstanding	5,191 4 3
,, Stationery, Postages and General Expenses	132 2 4	,, Subscriptions and Donations ..	3,843 9 11
,, Part Cost Supplementary Annual Report	24 18 6	,, Sundry Receipts	14 17 11
,, Conference and Meeting Expenses ..	47 15 4		
,, Balance :			
Cash at Bank .. £4,341 13 10			
Loan Account* .. 4,340 2 1			
	8,681 15 11		
	£9,049 12 1		£9,049 12 1

Since its foundation in 1926, the Membership Scheme has proved of real value to the Station on numerous occasions. Inspection of the accounts for the Membership Fund reveals a credit balance of £4,342 on 30th September, 1943, but, since the Trustees of the Endowment Fund are now in a position to refund the sum of £2,312 loaned by the Membership Fund for the purchase of the Merryweather property, there is actually a sum of £6,654 in hand at the time of writing.

Since its inception in 1926, subscriptions and donations under the Membership Scheme have totalled nearly £19,000, and members may like to be reminded of some of the functions the Scheme has fulfilled during that period.

1. It has maintained, at small cost, a body of Associates interested in the Station, who have actually been the main contributors to our Special Appeal Funds, e.g. the Endowment Fund (1929), the 21st Anniversary Fund (1934) and the Bradbourne Estate and Development Fund (1939), and it has been the chief medium for the dissemination of the results of our research.

2. It has made possible the retention of promising young workers on new lines of work before we could convince the Ministry of Agriculture of their value. It has enabled us to meet " hard cases " by special and supplementary grants. During the last nine years some £5,000 has been contributed for such purposes.

3. It has made small contributions to the better equipment of the Institute by providing money for essential additions for which no Government grants were forthcoming, e.g. the photographic studio and the insectary.

4. The Fund has proved a useful reserve in times of crisis in meeting special calls for ready money, as when Merryweather and Bradbourne were purchased, options on both of which would have been lost if reliance had had to be placed on the inevitably slow negotiations through official channels.

Thus, besides being our main supporters at times when the Station has needed the help of the Industry, our members have made some valuable direct contributions to research. The Committee, therefore, hope that the steady increase in membership during the past two years will be maintained in the difficult years to come.

Buildings and Land.—All buildings have been maintained in as good a condition as possible, but labour for painting and repairs has become very difficult to obtain. Work on the Court Lodge property, the surrounding estate walls, and the main Bradbourne entrance, has been delayed, and it appears unlikely that very much progress will be made until the end of the war. On the other hand the clearing of superfluous timber and shrubberies and the clearing of the land surrounding Bradbourne house and in the walled gardens has progressed well. This is a necessary preliminary to a post-war development, and in the meantime useful food crops are being produced on the lands so cleared.

Staff.—Since June, 1943, when the last Report was written, until the time of writing (June, 1944), there have been few changes among the senior staff, though in two sections, Plant Pathology and Plant

* Loan Account includes an advance of £2,311 13s. 10d. to Trustees for purchase of Merryweather property.

Protective Chemistry, there have been additions to the assistant scientific staff to meet new commitments. Among the laboratory assistants, however, the changes have been more numerous and the additional strain on senior research workers due to these changes will be well understood.

In the Pomology Section, Mr. N. H. Grubb reached the retiring age during the year. Mr. Grubb's work on pruning and, more recently, on breeding new varieties of raspberry will be familiar to thousands of growers who have visited the Station during the past twenty-five years. The classification of cherry varieties and the selection and trial of cherry rootstocks are subjects which he has also made his own. Our members will be glad to learn that, on the Committee's invitation, he has agreed to continue his work on raspberries and the classification of cherries for a further year.

Dr. A. B. Beakbane was awarded the Onslow Prize for outstanding work in Biology by Newnham College, Cambridge, for her studies of the anatomy of the Malling clonal rootstocks, and we congratulate her on this recognition of the valuable contribution she has made to our knowledge of rootstocks.

The Agricultural Research Council have continued their grant to Mr. J. Floor, whose leave from the Royal Netherlands Army has been extended. He has thus been enabled to add materially to his useful work on simple standardized methods for the identification of rootstocks and strawberries. In July, Miss J. M. Buttfield joined the section as special assistant in connection with the Ministry of Agriculture's nuclear stock scheme.

During the year the Biochemistry Section has continued to benefit from the close collaboration of members of the staff of the Imperial College stationed at East Malling. In September, Professor V. H. Blackman retired from his position as head of the Research Institute of Plant Physiology. Since that date his place in the direction of the Mineral Deficiencies team has been taken by Professor F. G. Gregory. We are glad to report, however, that Professor Blackman has by no means ceased to take a special interest in the work of the team. In April, 1944, Miss M. E. Bunyard was appointed as special assistant for clerical duties with the team, and in the same month Miss B. E. Champion came for a short time as temporary field assistant.

In November, the Agricultural Research Council made a grant for a special assistant in the Plant Pathology Section to work full time in Scotland on the increasingly important raspberry virus disease investigations. We were fortunate in obtaining the services of Dr. C. H. Cadman, who has had considerable experience of potato virus diseases at the Scottish Society of Research in Plant Breeding, Corstorphine. Dr. Cadman is also an expert grafter, an accomplishment which will be of peculiar value in these investigations. As we write, we are also able to welcome Miss K. M. Goodwin to the team of workers now engaged on research on the virus diseases of small fruit and hops.

In October, Miss M. P. English was appointed as assistant biologist in the Pathology Section, attached to the Plant Protective Chemistry Section for the fungicide testing work previously undertaken by Dr. Montgomery. Apart from this appointment, however, it had been evident for some time that if the Section's programme was to be carried out, and Dr. Shaw's other wartime commitments fulfilled, he would have to be given additional chemical assistance. In the New Year, the Agricultural Research Council approved the appointment of an assistant chemist and we were able to welcome Mr. J. K. Eaton on his return to East Malling. Mr. Eaton, who was previously in the Biochemistry Section, was transferred to the Ministry of Supply in November, 1940, and we were fortunate in obtaining his release in March, 1944, to take up this new work.

The Staff Council re-elected Dr. W. S. Rogers as their representative on the Executive Committee.

Of the laboratory assistants, A. C. M. Codd joined the Navy in December, 1943; we wish him good fortune.

In August, Miss D. E. A. Yates joined the team of field recorders in the Pomology Section. During the year, in the Biochemistry Section, B. K. Woollard, Miss D. Martin and Miss J. E. Ralph resigned, while Miss P. W. Arnup also left to get married. Their places were taken by R. H. Greenfield, Miss C. C. Macnamara, Miss J. R. Gandon, Miss D. E. T. Hook and Miss B. M. Kidwell. In the Pathology Section, G. P. R. Mount left to take up other work in November and was succeeded by Miss B. I. Fleet. In connection with the Scottish raspberry disease investigations, Miss F. J. Newing joined the Section in May, 1944. With the increase in chemical work being undertaken in the Plant Protective Chemistry Section, the opportunity of a vacancy was taken to appoint an assistant with previous experience of chemical analysis and, in April, 1944, J. T. Greaves was appointed to the post.

The administrative staff carried on during the year under considerable difficulties. It is not perhaps generally realized how much the administrative work of the Station has increased during the last five years. The Research and Technical Staffs—including visitors from other Institutes—have nearly doubled the pre-war personnel. During this time the Research Farm has more than doubled in size, while the value of the sales of produce has increased fourfold. In the same period over 400 new members have been enrolled. All these increases affect the work of the administrative staff proportionately, while the numerous wartime returns and regulations, to say nothing of Income Tax, "Pay-as-you-Earn", have greatly added to their tasks. To meet this increased work, there has been

little or no increase in the Office Staff—indeed several of the more experienced clerical staff have left to join the Services and have been replaced by juniors. Lady Northbourne generously gave her services to help us run the flourishing War Savings Group over a difficult period. Miss G. Mitchell and Miss L. M. Godden were appointed during the year.

The Library, Greenhouse, Photographic and A.R.P. Committees have continued to do good work and we thank particularly the officers of these Committees for their assistance. The Fire Guard rota has been maintained, though in recent months the numbers have been depleted by new calls on the time of some of those who have assisted voluntarily since the start. In April, 1944, the A.R.P. Committee asked Dr. W. S. Rogers to undertake the duties of Fire Captain, and we are grateful to the local A.R.P. authorities for releasing him from his duties as a warden for this work.

During the last two years members of staff who lunch at the Station have had the advantage of a canteen run by a Staff Committee. Hot lunches were at first provided on two days a week and, so successful was this venture, this has now been extended to four days, some 30-40 lunches being served on each day. We should like to thank particularly the members of the Canteen Committee, who have put in a great deal of hard work for the benefit of their colleagues.

Candidates for Higher Degrees.—In April, 1943, Mr. C. E. Cornford was awarded a Ph.D. degree for a thesis entitled " A study of certain meteorological factors in relation to frost damage to horticultural crops ".

Towards the end of the year Mr. R. M. Greenslade submitted a thesis entitled " Biological studies of *Capitophorus fragariae*, *Dasyneura tetensi* and *Anthonomous pomorum*", and we are now able to add that he was awarded a Ph.D. degree in February, 1944.

The work for both these theses was completed at the Research Station, and we extend our congratulations to both workers on their success. Mr. J. K. Eaton will be presenting a thesis very shortly, and Mrs. W. O. Roberts, Biochemistry Section, is now registered as a candidate for Ph.D.

Voluntary Workers.—The Pomology Section has enjoyed the continued assistance of Mrs. D. Swithenbank throughout the year, and has had valuable help during the busiest part of the picking season from Miss E. Jones, Miss M. Place and Mr. John Wormald. The section is once again indebted to Miss R. F. Stern, who spent three periods at East Malling this year. The Biochemistry Section was assisted during a very rushed harvest season by two Cambridge undergraduates, Miss C. C. Rhodes and Miss R. Braithwaite. When the worst of the rush was over they lent a hand with some of the laboratory work. To all these helpers we wish to express our thanks.

Staff Meetings for Research Discussions.—Four staff discussions were held during the year, including (1) a symposium on Plum Diseases, opened by Mr. R. V. Harris and contributed to by Dr. H. Wormald, Dr. H. B. S. Montgomery and Mrs. D. Oxford on Bacterial Canker, and by Dr. W. A. Roach, Miss E. C. Thompson and Dr. H. B. S. Montgomery on Silver Leaf. We were fortunate in securing the presence of Professor F. T. Brooks, who made a valuable contribution to the ensuing discussion. (2) A discussion on cover crops by Dr. W. S. Rogers, Dr. Th. Raptopoulos and Mr. M. H. Moore with Dr. N. H. Pizer to assist with any questions of soil chemistry when they arose. (3) A discussion on the vegetative propagation of plants, opened by Dr. R. G. Hatton and developed by Mr. R. J. Garner, the physiological aspects being dealt with by Dr. M. C. Vyvyan. Sir F. W. Keeble, Professor V. H. Blackman and Professor F. G. Gregory joined in the general discussion and raised a number of interesting points. (4) An account of the wartime activities of the Biochemistry Section, in which Professor V. H. Blackman, Dr. W. A. Roach and Dr. D. W. Goodall spoke for the large team of workers concerned.

Collaboration.—Two important new programmes of collaborative research, begun during the year, were added to the steadily growing list of such projects undertaken under the auspices of the Agricultural Research Council ; while, in December, the preliminary discussions took place for yet a third.

In Scotland, investigations have been started in the diseases of raspberries, especially a new virus disease, Raspberry Leaf Curl, that is threatening the growing of Norfolk Giant raspberry there, with research headquarters at the Department of Botany, University College, Dundee, by courtesy of the Principal and Professor of Botany (Dr. R. J. D. Graham). A new member of the staff of the Pathology Section has been appointed to work full time in Scotland. In these investigations Mr. R. V. Harris has the co-operation of Dr. C. E. Foister, Plant Pathologist, and Dr. R. G. W. Dennis, Assistant Plant Pathologist of the Department of Agriculture for Scotland, Mr. G. B. Stuart, East of Scotland College of Agriculture, and Dr. B. T. Cromwell, West of Scotland College of Agriculture.

In the fundamental rootstock studies that Dr. A. B. Beakbane has been carrying out for a number of years, which may eventually lead to the elucidation of the reasons for the known rootstock effects on vigour and cropping as well as to a method of rootstock identification, she now has the valuable collaboration of Dr. R. Hill, A.R.C. Unit of Biochemistry at the Biochemistry School, Cambridge, particularly in working out a method for estimating the respiratory activity of rootstocks.

The A.R.C. has further undertaken a long-term piece of research into the incidence and control of the fruit tree Red Spider and the Apple Blossom Weevil in collaboration with Messrs. Pettar Ltd. and the Associated Fruit Growers of Essex Ltd. In this work members of the Entomology, Plant Protective Chemistry and Statistics Sections will be closely concerned.

The Pomology Section collaborated with Mr. J. M. S. Potter in a study of the behaviour of a range of apple varieties on rootstocks, Malling Nos. I and II, for which purpose records were made of trees in the variety trials at the R.H.S. Gardens, Wisley. Also, on the question of the identification of strawberry varieties, they have worked with Mr. Potter of Wisley and Mr. C. H. Oldham of the Ministry of Agriculture and with Mr. C. Howard Jones of the Kingsley Fruit Farm and Nurseries. The Section has been assisted by the Campden Research Station and various canning factories, especially those of Messrs. Foster Clark and Smedley, in testing the canning quality of various soft fruit, including some of Mr. N. H. Grubb's new raspberry seedlings.

Dr. W. S. Rogers has put his experience of cover cropping at the disposal of Messrs. Imperial Chemical Industries Ltd. and the Norfolk W.A.E.C., in connection with proposed new trials. He and Mr. R. V. Harris combined with the County Horticultural Officers of Devon and Cornwall and the Ministry of Agriculture's Inspectors in making a tour to study strawberry propagation and disease problems in these two counties.

The Biochemistry Section has maintained its close collaboration with the Imperial College Research Institute of Plant Physiology and its wide contacts with Long Ashton, Rothamsted, and various advisory officers and centres in the South of England and in Wales, in their investigations on mineral deficiencies. Dr. D. W. Goodall has had special assistance from Mr. M. N. Nicholson, Advisory Chemist at Reading, and the Hampshire W.A.E.C. in obtaining samples from four barley fertilizer trials.

Once again the Entomology Section, together with Dr. E. Cameron of Inverness, has collected Codling Moth larvae for Canada. Dr. G. H. L. Dicker, in his survey of the Strawberry Aphis, has received valued assistance from Mr. H. Taylor (Hants. W.A.E.C.), Mr. L. F. Clift (Worcs. Horticultural Superintendent), Mr. W. F. Cheal (Horticultural Superintendent, Isle of Ely), Messrs. J. W. Ewan and J. E. Spickernal of the Ministry of Agriculture, and Messrs. S. H. Bennet and C. J. Hickman of Evesham Field Station.

Dr. H. Shaw has collaborated with the Chemical Research Laboratory, D.S.I.R., in the synthesis and testing of potential ovicides. The Statistics Section has worked with Dr. S. S. Zilva in the design and interpretation of his experiments on the vitamin C content of apples and has given assistance to Messrs. Technical Products Ltd. in connection with trials on insect control by spraying.

The Plant Pathology Section has carried out a field experiment for Rothamsted Experimental Station (Department of Plant Pathology) as a unit in their " Co-operative Potato Lifting-Spacing Trials ". The scope of the Hop Disease Investigations has been enlarged and Mr. E. H. Wilkinson of Long Ashton is now assisting with hop diseases in the West Midland Section, Professor E. S. Salmon of Wye is sending forward his new Wye seedlings to be tested for resistance to Verticillium Wilt, while Dr. N. H. Pizer of Wye and Dr. D. H. Osmond of Long Ashton are assisting on the soil aspects of Verticillium Wilt. Collaboration with Mrs. D. Oxford (Special Research Officer of the A.R.C.) on the causes of resistance to Bacterial Canker of plums was kept up for a further year.

Dr. M. C. Vyvyan has received help from Dr. E. S. J. Hatcher (Imperial College of Science, London) in testing synthetic growth substances and preparations by the " Avena " test.

The testing of the new varieties of hops has been continued in collaboration with Professor E. S. Salmon. Dr. T. K. Walker of the Institute of Technology, Manchester, and the late Mr. J. S. Ford of Messrs. Wm. Younger & Co. Ltd., Edinburgh, have carried out analyses for P.V. of many of the new varieties. Four firms of Brewers' Chemists also kindly undertook to analyse a number of samples under the present difficult circumstances. Dr. A. H. Burgess has given us the benefit of his advice in connection with the proposed drying of small lots of hops for the estimation of hill to hill variation in P.V.

We collaborated with Mr. W. C. Corbett, K.E.C. Glasshouse and Market Gardens Advisory Officer, in a tomato variety trial and in an onion time of lifting trial, both in Bradbourne Gardens. The latter trial was conducted for Mr. J. C. Wallace of Kirton and was primarily concerned with the effect of lifting time on Neck Rot disease.

Finally, we must once again refer to the many facilities both in their refrigerating chambers and in their workshop, which the Ditton Laboratories have continued so generously to extend to us.

We wish to record our thanks to all these people who have rendered us such valuable collaboration over a wide range of important problems.

Outside Trials.—The Entomological Section continues to make large use of outside trials, chiefly owing to the difficulty of finding any required pest in sufficient quantity at the Research Station.

Dr. A. M. Massee has carried on his studies of Hop Strig Maggot at the farms of Mr. H. E. Overy at Paddock Wood, Mr. H. E. Bennett at Ditton, and Miss Goodwin at Lyghe. He and Dr. G. H. L. Dicker have tested dusts against Apple Blossom Weevil on the farm of Mr. L. Burbridge at East Malling. Dr. Dicker is also indebted to a large number of strawberry growers in Hampshire, Worcestershire, Gloucestershire, the Isle of Ely and Kent for permitting him to make observations on the Strawberry Aphis in their fields. He has also had trials of vaporized nicotine against this pest on daughter nurseries in Kent.

Several members of the Plant Pathology Section went outside the Station for experimental material. Mr. R. V. Harris carried out field transmission experiments on raspberry virus diseases in Scotland on the farms of Messrs. Chivers & Sons, Montrose, and Mr. James McLeish, Coupar Angus. Dr. W. G. Keyworth has continued his Hop Verticillium Wilt resistance trials on the farms of Messrs. Whitbread & Co., Beltring, and established new ones on the farms of Messrs. H. E. Overy, Paddock Wood, H. J. Highwood, Horsmonden, and J. Day, Marden. Mr. I. Isaac has a trial of Strawberry Verticillium Wilt on a farm of Messrs. Chivers & Son in Cambridgeshire, and Mr. M. H. Moore has a spraying trial against Apple Canker at the farm of Messrs. Hunt & Sons, Brenchley.

The Biochemistry Section has carried out a number of mineral deficiency trials on agricultural crops in various parts of the country. These trials included the diagnosis of the deficiency and attempts at rectifying it in each case.

The Pomology Section has maintained and recorded the apple rootstock plots on five Kent soil types with the co-operation of the Kent County Horticultural Officers and the growers concerned. Mr. R. J. Garner has laid down a hardwood cutting trial at the nursery of Messrs. Fromow in Surrey where the soil and climate are very different from those at the Research Station.

Advisory Work.—*Correspondence.*—The number of postal enquiries dealt with during the past year has shown a very large increase over previous years. The total number was 2,481, of which 705 came from Kent, 169 from Sussex, 148 from Surrey, 137 from Essex, 39 from Norfolk, and 48 from overseas. Although a large proportion of these came from commercial fruit growers, an ever-increasing number are coming from amateurs, who seem to be becoming more and more interested in producing fruit in their own gardens and allotments. In addition, 450 letters (excluding circulars) were sent out under the Strawberry Nuclear Stocks Scheme and many of these contained advice.

Visits.—Shortage of petrol supplies and pressure of other work has kept down the number of advisory visits paid by members of staff. In all, 215 visits were made, of which 89 were by Dr. W. G. Keyworth to hop growers, and 53 were by Dr. A. M. Massee. As far as possible we have referred advisory visits to the County Advisory Officers under Mr. W. G. Kent, and they have paid 498 visits in addition to some hundreds of visits and demonstrations in connection with K.W.A.E.C. work, at most of which advice was given. We once more record our gratitude to these officers for their valuable co-operation with us. Dr. Massee has maintained his evening visits, once a week, to the allotments in the East Malling area to advise on insect pests of food crops.

Fruit Farm Demonstrations.—At the request of the K.W.A.E.C. various members of staff attended a total of six Fruit Farm Demonstrations organized by Mr. W. G. Kent and his staff and answered questions of a specialist nature.

Lectures and Demonstrations.—*Lectures.*—At the request of the K.W.A.E.C., the Research Station assisted with the instruction in fruitgrowing of twelve members of the Women's Land Army. Mr. R. J. Garner dealt with grafting methods and Dr. A. M. Massee, Mr. M. H. Moore and Dr. H. Shaw covered the subjects of pests and diseases and their control. As a part of the course the members paid three visits to the Research Station and were shown round the various experimental plantations.

A team of members of staff was invited to attend and read papers at a two-day Orchard Conference organized by the Essex War Agricultural Executive Committee. The subjects under discussion were Mineral Deficiencies, Soil Management, Pollination, Factors influencing Fruit Development and the Control of Red Spider and Apple Blossom Weevil, the contributions including papers on these subjects from Drs. Dicker, Massee, Montgomery, Roach, Rogers, and Shaw. The Conference was attended by about fifty Essex fruitgrowers and was considered most helpful to the research workers and fruitgrowers alike.

Dr. R. G. Hatton gave talks on the work of the Research Station at the School of Biochemistry, Cambridge, on the Amateur Fruit Garden at the R.H.S. Fruit and Vegetable Show, and on Fruitgrowing in Wartime at the Ministry of Agriculture's Press Conference.

Other lectures included three by Mr. N. B. Bagenal to Jewish students of Birkbeck College, London, one by Dr. W. S. Rogers to the Norfolk W.A.E.C. Discussion Group at Upwell, and two by Mr. R. V. Harris on virus diseases to fruitgrowers in Scotland.

By arrangement with the Kent Education Committee, Mr. H. C. Chapelow has given 49 lectures, with demonstrations, on gardening and beekeeping to gardening societies, allotment holders and

Women's Institute meetings in various parts of the county. He has also held 57 practical classes, mainly for school teachers of the K.E.C., and for Canterbury and Gillingham Technical Institutes.

Demonstrations.—In spite of wartime difficulty of travel and the preoccupation of members of staff with urgent problems, five important demonstrations were held during the year.

In January, by arrangement with the Ministry of Agriculture and the Horticultural Education Association, a Pruning and Frameworking course was held at the Research Station and local farms for members of County Advisory Staffs. The course occupied a week and was attended by 26 officers from all parts of the country. We are indebted to Mr. C. R. Thompson for assistance with this course.

In early June a short refresher course on the roguing of strawberries for virus disease was held for Ministry of Agriculture Inspectors.

At the end of June a widely representative party of raspberry growers and others interested in this fruit gathered at the Station to consider the new raspberry seedlings raised by Mr. N. H. Grubb. In particular the visitors were asked to judge the relative merits of those varieties already selected for large-scale propagation and trial. The programme included a talk on diseases of raspberries by Mr. R. V. Harris with special reference to those that showed some promise of being controllable by the breeding of new varieties.

In July, a one-day course for Hop Factors was arranged, when Dr. W. G. Keyworth showed how Hop Verticillium Wilt affected the hop plant and demonstrated how to recognize it in the field. A similar course on a smaller scale was given to Ministry of Agriculture Inspectors in early August.

We were especially pleased to welcome a party of members of the Horticultural Trades Association, led by their President, Lt.-Col. H. R. Fletcher, on 25th August, when the party made a tour of the experimental nurseries and the rootstock experiments. The day finished with a short conference at Bradbourne where possible measures to meet the immediate shortage of clonal rootstocks were discussed. We were fortunate in having Professor B. T. P. Barker and Dr. T. Swarbrick of Long Ashton present, to talk on the subject of seedling rootstocks.

It was planned to hold at least one open day for members during the winter, but this proved to be quite impossible.

Mr. R. J. Garner gave four grafting demonstrations in West Norfolk and one at the Midland Agricultural College.

Committee Work and Conferences.—Various members of staff have had increasingly heavy demands on their time through service on external committees in relation to research, food production, education and administration matters. The preparation of memoranda for these Committees made further demands. The present-day tendency to carry on joint research with other institutes and organizations has entailed many conferences, the more important of these being on hop diseases, Red Spider and small fruit diseases, and on the establishment of raspberry cane nurseries in Scotland. Members of staff also attended and joined in many meetings and conferences of scientific and educational societies.

Exhibits.—Exhibits were assembled on various fruitgrowing topics and sent to Penarth and the Isle of Wight. Photographs were lent to the Ministry of Agriculture in connection with exhibits they were preparing. Lantern slides, photographs and ciné-films were supplied to the Yorkshire Education Department for a refresher course on fruitgrowing for their instructors. An exhibit of new varieties of hops was staged at Borough Market, and one of cherries and raspberries at the R.H.S. Show, Vincent Square.

The Entomology Section staged an interesting exhibit on pests of fruit and vegetables at " Dig for Victory " shows at Maidstone, Sevenoaks, Loose, Sidcup, Bexley Heath, Wrotham and Gravesend, and attended to answer questions. They also supplied exhibits for the Women's Institute at Staplehurst, the Women's Land Army at Maidstone and other shows conducted by the horticultural staff of the K.E.C.

Visitors.—On the whole fewer visitors came to the Research Station during the year, those recorded in the book numbering only 719. As there were no really large gatherings during the year to swell the number of visitors, this figure represents a large number of small parties and individual visitors, and during the summer months these visitors come nearly every day. Many visitors come without appointment and we would urge the importance, with present shortage of staff, of making an appointment in advance. Otherwise visitors may arrive and find no one available to see them and show them round. Visitors still frequently pass by our visitors' book without signing it, so that we have no record of their visit.

We were pleased to have the opportunity of entertaining two parties of Canadian soldiers, arranged by the British Council, who were very interested to compare conditions here with those in Canada.

We were also able to keep up the special visits of parties of students from Swanley College and Reading University. Our overseas visitors, mainly members of the Allied Forces, included fruitgrowers and research workers from Canada, Africa, New Zealand, Ceylon, Burma, U.S.A., Argentine, Norway and Portugal. The Chairman of the Agricultural Research Council, Earl de la Warr, paid us an informal and welcome visit. Professor G. W. Robinson brought the Soil Research Sub-Committee (A.R.C.) to discuss with us the soil problems arising out of our various lines of investigation.

Distribution of Rootstocks and Experimental Material.—*Rootstocks.*—Rooting, on the whole, was well up to standard and some 477,922 first grade rootstocks and 316,105 second size layers suitable for bedding up were distributed, making a total of 794,027 rootstocks produced. Good weather conditions while the layers were being taken off made it possible to get the stocks trimmed, graded and dispatched before the middle of January, but owing to shortage of labour practically all other outside work came to a standstill while this was in progress.

The demand for rootstocks, worked trees and the new varieties of hops was greater than ever before, owing to the general shortage of material throughout the country, and greatly exceeded the supply. No less than 2,000,000 rootstocks of all kinds were asked for by the trade and fruit growers. It was decided, in consultation with the H.T.A., that certain varieties in special demand should be allotted only to applicants who undertook to use them for further stool and layer beds. We were only able to send 3,250 stocks to our Canadian members, although many more were asked for by them.

Bush Fruits.—Some 25,500 black currants, 15,000 raspberry canes, 4,000 red currants and gooseberries and 2,500 loganberries were distributed. The growth of the black currants was so good, being raised on new land at Bradbourne, that treble the usual number of packages had to be made to comply with the postal regulations. In all some 1,470 packages were despatched, apart from consignments that were collected by road.

Worked Trees.—Much time and thought had to be spent in making a fair distribution to our Associate Members of the 5,400 apple, pear and plum trees that were available. A few walnut trees were also sent out. The demand for trees and bushes from educational and research institutions was less than usual, only 28 consignments being despatched.

Hops.—We were able to send out 1,675 sets of Brewer's Gold (C9a), 835 sets of Bullion Hop (Q.43), 1,680 sets of Quality Hop (0063), 925 sets of Fillpocket (Z62), together with small quantities of Malling Midseason (BB28), College Cluster (N15 bis) and Brewer's Stand-by (HH44). These were distributed to growers in Kent and Sussex.

Fruit.—Fruit for dehydration investigations has again been supplied to Ditton Laboratory. Strawberries of known origin and maturity were supplied to Dr. S. S. Zilva, of the Lister Institute, for Vitamin C tests.

Station's Publications.—Twenty scientific papers and twenty-six growers' bulletins were published ; the titles of these papers appear in the Annual Report.

Journal of Pomology and Horticultural Science.—Owing to the inevitable preoccupations and delays in communications, suitable manuscript was still slow in coming to hand during the year and it was only possible to complete Volume XX. It is hoped that Volume XXI will be completed during 1944 and, with some slight concession in the use of paper, that this will be a larger volume than the last. If possible, the volume will be published as a whole and not in separate parts, so that its publication may be complete before the end of the year.

Library Committee.—In spite of considerable delays in the supply of new books and journals and in the binding of periodicals, the Library in 1943 functioned, on the whole, with gratifying success. By far the most serious inconvenience arose from the unduly long absence of periodicals at the binders. Although repeated efforts have failed to mitigate this difficulty, the Committee feels that to guard against loss and damage it must continue to have bound at least those volumes in most frequent demand. It seems, therefore, that this state of affairs will have to be faced throughout the war period as being inseparable from wartime conditions.

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